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10/045,472	11/08/2001	Alok Chandra Ratogi	8920-000007	9771

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HARNESS, DICKEY & PIERCE, P.L.C.  
P.O. BOX 828  
BLOOMFIELD HILLS, MI 48303

EXAMINER

CROSS, LATOYA I

ART UNIT PAPER NUMBER

1743

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/045,472

Applicant(s)

RATOGI ET AL.

Examiner

LaToya I. Cross

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-29 is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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### DETAILED ACTION

This Office Action is in response to Applicants' amendments dated March 19, 2004.

Claims 1-29 are pending.

#### *Claim Observations*

Claim 6 recites "the evaporated electrode", for which there is no antecedent basis in the base claim. It is suggested that Applicants indicate in claim 1 that the electrodes are evaporated. Or, Applicants should amend claim 6 to delete the term "evaporated".

#### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicants have amended the independent claims to recite the bismuth molybdate being a mixture of bismuth hexanoate and molybdenum hexanoate. In the specification at page 9, Applicants state,

The thin film of the precursor solution is preferably made from a solution of bismuth molybdenum hexanoate solution. This precursor solution may be made by a person skilled in the art to get a solution which upon spray pyrolysed on a substrate at a desired temperature will yield a thin film of any of the three phases of the film namely the  $\alpha$ , or  $\beta$  phases of the bismuth molybdate film. The two phases can be obtained by mixing appropriate quantities of bismuth hexanoate and molybdenum hexanoate solutions to get the desired stoichiometric precursor solution. By spray coating the precursor solution, at a substrate temperature of 200 to 300°C pure alpha or beta phases of bismuth molybdate can be prepared (using the appropriate initial composition) having white, beige colours.

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Thus, it appears that the claimed bismuth molybdate is not a mixture of bismuth hexanoate and molybdate hexanoate. Instead, the precursor for the claimed bismuth molybdate is formed by mixing bismuth hexanoate and molybdate hexanoate in the appropriate quantities. The claimed bismuth molybdate is formed by spray coating the precursor mixture onto a substrate held at a particular temperature to form the claimed bismuth molybdate. Applicants do not have support for the bismuth molybdate being a mixture of bismuth hexanoate and molybdate hexanoate. The new matter must be deleted from the claims.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-15 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as obvious over US Patent 5,082,789 to Morrison et al.

Morrison et al teaches a thin film gas sensor for detecting alcohols, specifically ethanol in breath samples. The gas sensors comprise bismuth molybdate deposited onto a thin film substrate. Electrical contacts are also deposited onto the substrate, as recited in claim 1 (col. 2, lines 27-29, col. 6, lines 51-55). With respect to claim 2, the substrate is taught as being glass or quartz (col. 6, lines 47-49). The contacts are made of gold, as recited in claim 6 (col. 6, lines 51-55). With respect to claims 3 and 4, the ratio of bismuth to molybdenum is 2:3 or 2:2 (col. 6, lines 39-46). Example 2 of the reference teaches applying the electrical contacts by vacuum evaporation, as recited in claim 5. Figure 6a, example D, shows 10 ppm ethanol being

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detected, as recited in claim 7. Figure 6a also show sensitivity for ethanol from 1 ppm to 100 ppm. With respect to the change in resistance (claims 8 and 9) and the storage stability (claim 11), it is assumed that these properties are inherently present because the ethanol sensor claimed by Applicants is the same as that taught by Morrison et al. Because of this, it is presumed that the properties are the same, absent evidence to the contrary. With respect to the method preparing the gas sensors, Morrison et al teach depositing a precursor solution of bismuth molybdate solution in a 1:1 ratio. The powder was melted and vacuum evaporated onto a quartz substrate until a thin film was formed. The film was calcined at a temperature of 400°C. Next, gold electrical contacts were applied by evaporation onto the substrate. See Examples 1 and 2.

For the purpose of this rejection, the phrase "comprising a mixture of bismuth hexanoate and molybdenum hexanoate" has been interpreted in light of the specification, page 9 to mean that bismuth molybdate is prepared from a precursor of a mixture of bismuth hexanoate and molybdenum hexanoate. Because this is a product by process limitation, the manner in which bismuth molybdate prepared is not sufficiently limiting to be accorded patentable weight. See MPEP 2113.

Therefore, for the reasons set forth above, Applicants' claimed invention is deemed to be anticipated, within the meaning of 35 USC 102, or in the alternative, obvious, within the meaning of 35 USC 103, in view of the teachings of Morrison et al.

#### ***Claim Rejections - 35 USC § 103***

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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6. Claims 16, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morrison et al in view of US Patent 5,252,140 to Kobayashi et al.

The disclosure of Morrison et al is described above.

With respect to claims 16, 17 and 19, Morrison et al differs from the instantly claimed invention in that there is no teaching of spray pyrolysis or thermal evaporation for depositing the thin film or electrode.

Kobayashi et al teach that spray pyrolysis and thermal evaporation are conventional methods for depositing film layers onto thin film devices, where the substrate is glass or silica. It would have been obvious to one of ordinary skill in the art to use any known deposition method, such as spray pyrolysis or thermal evaporation to deposit the thin film onto the substrate in Morrison et al. Both spray pyrolysis and thermal evaporation have proven to be suitable techniques that provide stabilized properties at a low cost.

Therefore, for the reasons set forth above, Applicants' claimed invention is deemed to be obvious, within the meaning of 35 USC 103 in view of the teachings of Morrison et al and Kobayashi et al.

#### ***Allowable Subject Matter***

7. Claims 20-28 and new claim 29 are allowed.

8. The following is a statement of reasons for the indication of allowable subject matter: With respect to claims 20-28, the prior art of record fails to teach or suggest preparing a solution of bismuth molybdenum hexanoate by dissolving molybdenum trioxide in oxalic acid, adding 2-ethyl hexanoic acid, heating and adding bismuth trioxide. Morrison et al teach dissolving ammonium molybdate in  $\text{NH}_4\text{OH}$  and dissolving bismuth nitrate in nitric acid,

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followed by adding the molybdate solution to the bismuth solution, a process quite different from that instantly claimed. With respect to claim 29, the prior art fails to teach or suggest preparing an ethanol sensor using the solution of bismuth molybdenum hexanoate described above. US Patent 4,504,420 to Ebner teaches a method of forming bismuth molybdenum, wherein molybdenum trioxide and bismuth trioxide are used. However, the reference fails to teach dissolving molybdenum trioxide in oxalic acid and adding 2-ethyl hexanoic acid.

### *Response to Arguments*

9. Applicant's arguments filed on March 19, 2004 have been fully considered but they are not persuasive. With respect to the anticipatory and obviousness rejections over Morrison et al, Applicants argue that Morrison et al fail to teach bismuth molybdate comprising a mixture of bismuth hexanoate and molybdenum hexanoate. The Examiner considered this limitation to be new matter and has interpreted the limitation in light of the specification at page 9 to mean that bismuth molybdate is prepared from a precursor of a mixture of bismuth hexanoate and molybdate hexanoate. Thus, the limitation involves how the bismuth molybdate recited in claims is prepared – a product by process limitation. MPEP 2113 states that “Even though product by process limitations are defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production”. Thus, Applicants' limitation of the manner in which bismuth molybdate is prepared is not sufficiently limiting to make the claimed bismuth molybdate in an ethanol sensor patentable.

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3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LaToya I. Cross whose telephone number is 571-272-1256. The examiner can normally be reached on Monday-Friday 8:30 a.m. - 5:00 p.m..


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Jill Warden  
Supervisory Patent Examiner  
Technology Center 1700